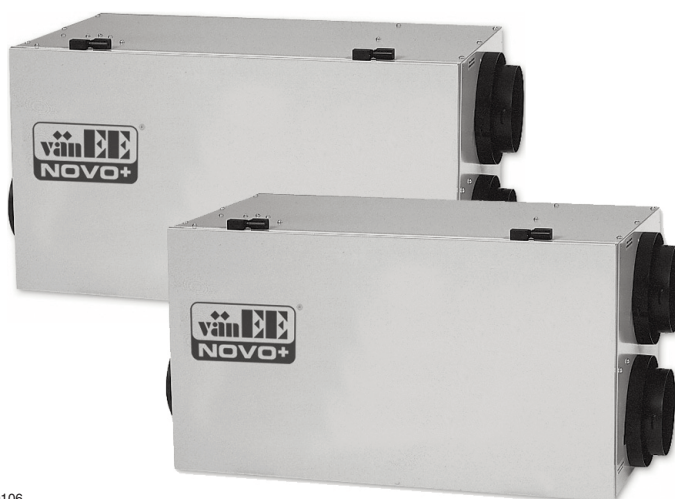


VENTILATION SYSTEMS FOR RESIDENTIAL USE ONLY



VB0106

90H Novo+ (Part No. 1601607)

190H Novo+ (Part No. 1601609)



About this Manual

This manual uses the following symbols to emphasize particular information:

WARNING

Identifies an instruction which, if not followed, might cause serious personal injuries including possibility of death.

CAUTION

Denotes an instruction which, if not followed, may severely damage the unit and/or its components.

NOTE: Indicates supplementary information needed to fully complete an instruction.

WARNING

When performing installation, servicing or cleaning the unit, it is recommended to wear safety glasses and gloves.

CAUTION

This unit is intended for residential use only.

NOTE: This installation manual refers to Novoclimat™ requirements. The specifications are subject to change without notice. For more details, refer to Novoclimat program.

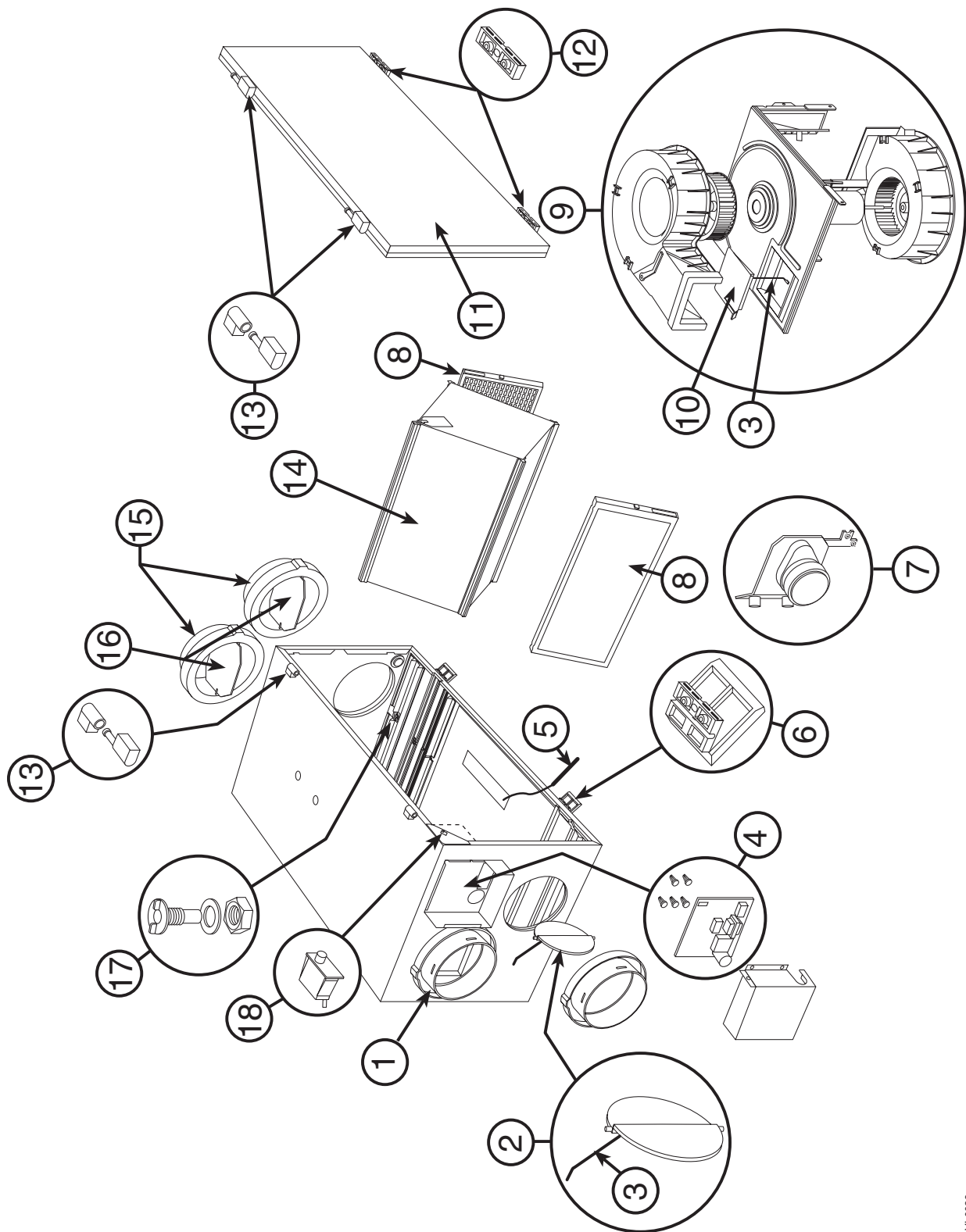
Novoclimat is a performing dwelling concept created by the *Agence de l'efficacité énergétique* of Québec, to insure comfort, health and savings for the occupants. Many requirements, mainly for the building envelope, tightness and ventilation must be met for a house to be Novoclimat certified, and vānEE has conceived a unit with all the HRV features required by this concept. Please note that Novoclimat also has specific requirements regarding the system and ducts installation and balancing.

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1. Service

1.1 3-D DRAWING



VL0029

1. Service (cont'd)

1.2 PARTS ORDERING CHART

No.	Description	90H NOVO+	190H NOVO+
		1601607	1601609
1	Double Collar Port #2	02257	02257
2	Damper #1 (kit)	12454	12454
3	Damper Rod (kit)	13037	13037
4	Electronic Board & Spacers (kit)	13038	13038
5	Thermistor (kit)	12895	12895
6	Door Latches & Screws	00886 (2)	00886 (2)
		00601 (4)	00601 (4)
7	Damper Actuator Assembly	13734	13734
8	Filter	03308	03308
9	Blower Assembly	12908	12912
10	Square Damper (kit)	13033	13033
11	Door Ass'y (including 12 & 13)	17206	17206
12	Door Latches (keeper) & Screws	00887 (2)	00887 (2)
		00601 (4)	00601 (4)
13	Hinge Ass'y (kit)	13036	13036
14	Heat Recovery Core	03322	03322
15	Balancing Double Collar Port	02256	02256
16	Balancing Damper	02253	02253
17	Drain Connector (kit)	03203	03203
18	Door Switch (SPST), E69 10A	01825	01825

Please note that parts not listed are not available; those parts require assembly knowledge that only manufacturer can guarantee.

TO ORDER PARTS: Contact your local distributor.

1.3 TECHNICAL SUPPORT (FOR ASSISTANCE)

For assistance, call on weekdays, from 8:30 a.m. to 5:00 p.m. (Eastern Standard Time).

NOTE: Do not call this number for ordering parts. This phone number is for the installers only.

1-888-908-2633 (toll-free)

2. Sizing

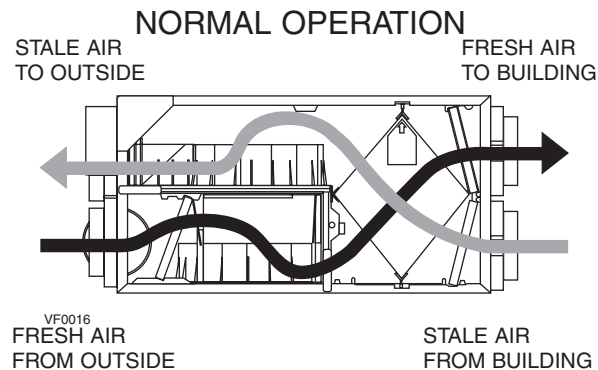
On high speed, the 90H Novo+ units produce about 150 cfm, and 190H Novo+ units produce about 189 cfm.

According to the Novoclimat Ventilation needs vs. the number of rooms chart, the 90H Novo+ units can be installed in house having up to 13 rooms*, and 190H Novo+ units can be installed in house having up to 16 rooms*.

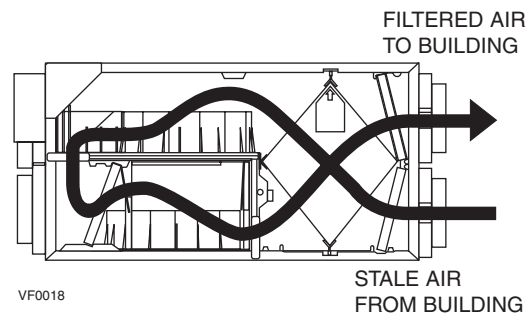
*Houses with a non finished section having an area less than 2/3 of the house, or without basement. Refer to Novoclimat requirements for more details.

3. Technical Data

3.1 AIR DISTRIBUTION



DEFROST AND/OR FILTRATION MODE

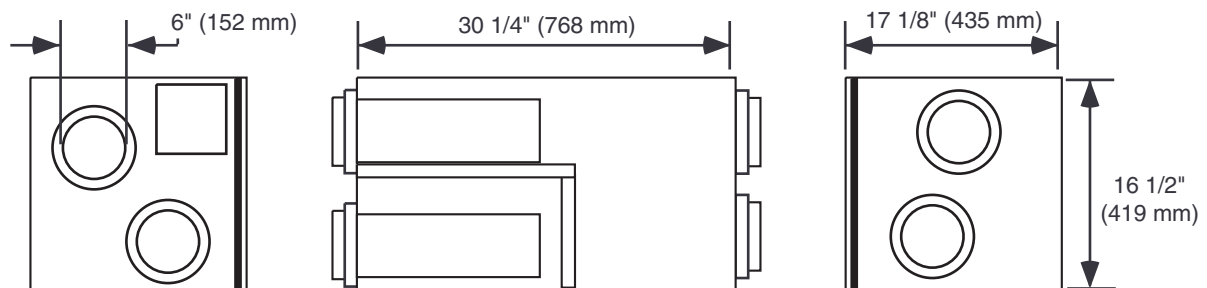


3.2 DEFROST CYCLES

Outside Temperature		Defrost Cycles		Extended Defrost Cycles	
Celcius (°C)	Fahrenheit (°F)	Defrosting (min.)	Operation time (min.) between each defrost cycle	Defrosting (min.)	Operation time (min.) between each defrost cycle
-5	23	6	60	10	30
-15	5	6	32	10	20
-27	-17	6	20	10	15

IN A COLD REGION, SET UP EXTENDED DEFROST BY REMOVING JUMPER JU1F OFF THE CIRCUIT BOARD.

3.3 DIMENSIONS



VK0029A

3.4 SPECIFICATIONS

Model	90H Novo+	190H Novo+
Weight	65 lb (29.5 kg)	67 lb (30.5 kg)
Port Diameter	6" (152 mm)	6" (152 mm)
Drain Diameter	1/2" (12 mm)	1/2" (12 mm)
Installation	Chains, springs and hooks (provided with the unit)	
Motor Speed	High and low speed factory set (optional increased or decreased low speed)	
Electrical Supply	120 V, 60 Hz	120 V, 60 Hz
Power Consumption	150 W	240 W

3. Technical Data (cont'd)

3.5 PERFORMANCE CHARTS

90H NOVO+

ELECTRICAL REQUIREMENTS: 120 VOLTS, 1.3 AMPS.

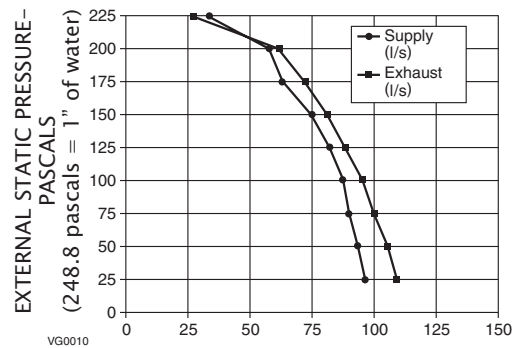
EXHAUST AIR TRANSFER RATIO: 0.01

Ventilation Performance

EXT STATIC PRESSURE	inwg	NET SUPPLY AIR FLOW			GROSS AIR FLOW					
		AIR FLOW			SUPPLY			EXHAUST		
Pa		l/s	cfm	m ³ /h	l/s	cfm	m ³ /h	l/s	cfm	m ³ /h
25	.1	83	175	299	83	176	299	83	175	295
50	.2	79	168	284	80	169	288	78	165	281
75	.3	75	159	270	75	159	270	75	158	270
100	.4	71	150	256	71	151	256	69	146	248
125	.5	64	136	230	64	136	230	60	127	216
150	.6	59	126	216	60	127	216	49	103	273
175	.7	53	113	191	53	113	191	38	80	227
200	.8	43	91	155	43	91	155	21	45	76

Energy Performance

SUPPLY TEMPERATURE C° F°		NET AIR FLOW l/s cfm m³/h			POWER CONSUMED WATTS	SENSIBLE RECOVERY EFFICIENCY	APPARENT SENSIBLE EFFECTIVENESS	LATENT RECOVERY/ MOISTURE TRANSFER
HEATING								
0	+32	31	66	112	85	69	81	-0.01
0	+32	56	119	202	124	60	70	-0.01
0	+32	--	--	--	--	--	--	--
-25	-13	37	78	133	114	62	80	0.08
-25	-13	--	--	--	--	--	--	--
COOLING								
+35	+95	--	--	--	--	TOTAL RECOVERY EFFICIENCY		
+35	+95	--	--	--	--	Not tested		



NOTE: All specifications are subjected to change without notice.

190H NOVO+

ELECTRICAL REQUIREMENTS: 120 VOLTS, 2.1 AMPS.

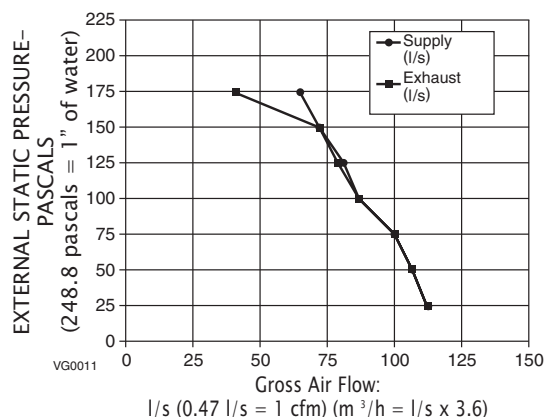
EXHAUST AIR TRANSFER RATIO: 0.01

Ventilation Performance

EXT STATIC PRESSURE	inwg	NET SUPPLY AIR FLOW			GROSS AIR FLOW					
		AIR FLOW			SUPPLY			EXHAUST		
Pa		l/s	cfm	m ³ /h	l/s	cfm	m ³ /h	l/s	cfm	m ³ /h
25	.1	110	234	396	112	237	403	112	237	403
50	.2	103	219	374	105	223	378	106	225	382
75	.3	98	208	353	100	211	360	99	210	356
100	.4	89	189	320	91	192	328	91	193	328
125	.5	84	177	302	85	180	306	82	174	295
150	.6	71	151	256	72	153	259	71	149	256
175	.7	64	136	230	65	138	234	44	94	158

Energy Performance

SUPPLY TEMPERATURE C° F°		NET AIR FLOW			POWER CONSUMED WATTS	SENSIBLE RECOVERY EFFICIENCY	APPARENT SENSIBLE EFFECTIVENESS	LATENT RECOVERY / MOISTURE TRANSFER
		l/s	cfm	m³/h				
HEATING								
0	+32	56	119	202	124	60	70	-0.01
0	+32	86	182	210	197	53	62	-0.01
0	+32	--	--	--	--	--	--	--
-25	-13	37	78	133	114	62	80	0.08
-25	-13	--	--	--	--	--	--	--
COOLING						TOTAL RECOVERY EFFICIENCY		
+35	+95	--	--	--	--	Not tested		
+35	+95	--	--	--	--	--		



NOTE: All specifications are subjected to change without notice.

4. Typical Installations

There are three (2) common installation methods.

4.1 FULLY DUCTED SYSTEM

(Primarily for homes with radiant hot water or electric baseboard heating. See Figure 1.)

The complete ductwork of the ventilation system consists in ducts for the fresh air distribution and other ducts dedicated to exhaust moist, stale air to the outside. Fresh air is supplied to bedrooms and principal living areas (at least one register per level). Moist, stale air is exhausted to the outside from the high humidity areas in the home, such as bathrooms.

Use an independant bathroom fan in washroom (without a bath tub nor a shower) and a range hood in kitchen to exhaust stale air.

Homes with more than one level require at least one exhaust register at the highest level.

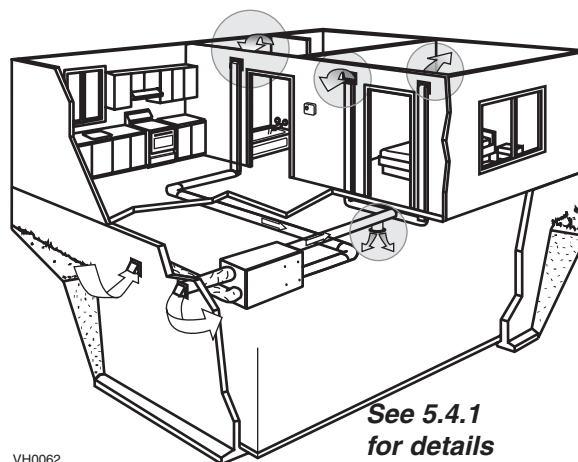


Figure 1

4.2 SYSTEM COMBINED WITH A FURNACE

(For homes with forced air heating. See Figure 2.)

Moist, stale air is exhausted from the high humidity areas in the home, such as bathrooms, kitchen and laundry room. Fresh air is supplied to the cold air return or the supply duct of the furnace.

Use an independant bathroom fan in washroom (without a bath tub nor a shower) and a range hood in kitchen to exhaust stale air.

Homes with more than one level require at least one exhaust register at the highest level.

NOTE: For this type of installation, it is essential that the furnace blower runs when the unit is in operation.

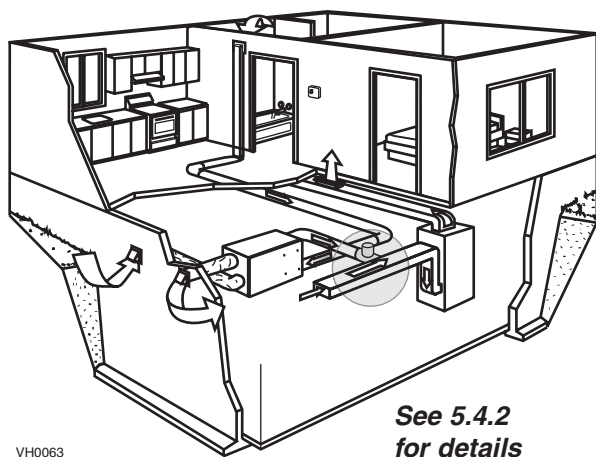


Figure 2

5. Installation

INSPECTING THE BOX CONTENT

- Inspect the **exterior of the unit** for shipping damage. Ensure that there is no damage to the door, door latches, door hinges, dampers, duct collars, cabinet, etc.
- Inspect the **interior of the unit** for damage. Ensure that the fan motor assembly, heat recovery core, insulation, dampers, damper actuator and condensation tray are all intact.
- If the unit was damaged during shipping, contact your local distributor. (Claims must be made within 24 hours after delivery.)
- Use checklist included with the unit to ensure that no parts are missing.

5.1 LOCATING AND MOUNTING THE UNIT

Choose an **appropriate location** for the unit:

- Within an area of the house where the temperature is above 10°C/50°F (basement, furnace room, laundry room, etc.).
- Away from living areas (dining room, living room, bedroom), if possible.
- So as to provide easy access to the interior cabinet and to the control panel on the side of the unit.
- Close to an exterior wall, so as to limit the length of the insulated flexible duct to and from the unit.
- Close to a drain.
- Away from hot chimneys, electrical panel and other fire hazards.
- Allow for a power source (standard outlet).

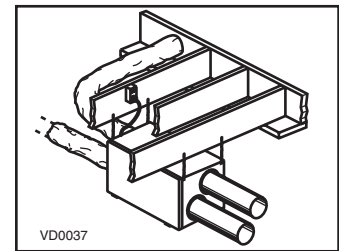


Figure 4

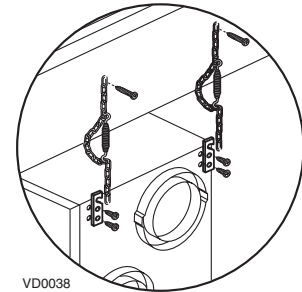


Figure 5

CAUTION
Make sure the unit is level, with a 1/8" (3 mm) tilt backwards (see Figure 6).

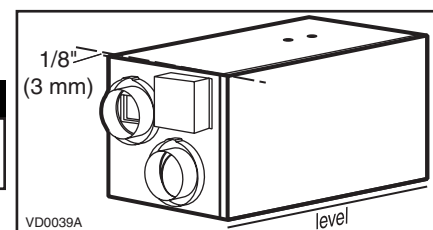


Figure 6

5.2 PLANNING THE DUCTWORK

- Follow the instructions in Section 5.3 on next page to determine the appropriate duct diameters for your system.
- Keep it simple. Plan for a minimum number of bends and joints. Keep the length of insulated duct to a minimum.
- Do not use wall cavities as ducts. Do not use branch lines smaller than 4" (102 mm) Ø.
- Do not ventilate crawl spaces or cold rooms. Do not attempt to recover the exhaust air from a dryer or a range hood. This would cause clogging of the recovery module. Use rigid ducts for fresh air distribution and stale air exhaust ("warm" side of HRV) and sheet metal for the kitchen exhaust duct (if need be).
- Be sure to plan for at least one exhaust register on the highest lived-in level of the house if it has 2 floors or more.

5. Installation (cont'd)

5.3 CALCULATING THE DUCT SIZE

Use the table below to ensure that the ducts you intend to install will be carrying air flows at/or under the maximum air flow values. Never install a duct if its air flow exceeds the maximum value.

NOVOCLIMAT CHART FOR SIZE OF DUCT CONNECTED TO REGISTER VS. AIR FLOW

ROUND DUCT	RECTANGULAR DUCT	MAXIMUM AIR FLOW
4"	2¼" OR 3¼" x 10"	40 CFM
5"	2¼" OR 3¼" x 10"	65 CFM
6"	3¼" OR 4" x 10"	110 CFM

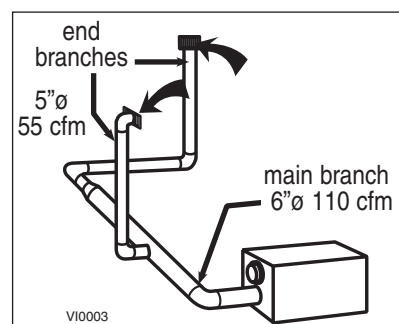


figure 7

5.3.1 Calculation Example:

Problem:

My installation requires two exhaust registers (both for the bathrooms). I will connect these registers to a main duct which will connect to the unit (high speed performance value of 110 cfm). What size of duct should I use for the main exhaust duct and for the two end branches leading to the registers? (See Figure 7.)

Solution:

Main duct: Table above indicates a 6" Ø duct: maximum air flow: 110 cfm. The high speed air flow of 110 cfm equals the maximum value (110). Therefore a 6" Ø duct or larger is an appropriate choice for the main exhaust duct.

End branches: Each end branch will have to transport an air flow of 55 cfm (110 divided by 2). Table above indicates a 5" Ø duct: maximum air flow: 65 cfm. The high speed air flow of 55 cfm is far enough away from the maximum value (65). Therefore a 5" Ø duct or larger is an appropriate choice for the 2 end branches.

NOTE: A 4" Ø duct would have been too small because the maximum acceptable value for a 4" Ø duct is 40 cfm.

5.3.2 Registers Location and Air Flows Distribution:

The registers location and the air flow distribution must be taken in account when performing ductwork installation. Refer to the Novoclimat table below to plan the registers location.

REGISTER LOCATION	FRESH AIR FLOWS		EXHAUST AIR FLOWS	
	MINIMUM REQUIRED	MAXIMUM ACCEPTABLE	MINIMUM REQUIRED	MAXIMUM ACCEPTABLE
KITCHEN	-	-	0	23,6 L/s (50 PCM)
DINING ROOM	4,7 L/s (10 PCM)	11,8 L/s (25 PCM)	-	-
LIVING ROOM	4,7 L/s (10 PCM)	18,9 L/s (40 PCM)	-	-
OFFICE	4,7 L/s (10 PCM)	9,4 L/s (20 PCM)	-	-
RECREATION ROOM	4,7 L/s (10 PCM)	18,9 L/s (40 PCM)	-	-
MASTER BEDROOM	9,4 L/s (20 PCM)	9,4 L/s (20 PCM)	-	-
SECONDARY BEDROOM(S)	4,7 L/s (10 PCM)	9,4 L/s (20 PCM)	-	-
MAIN BATHROOM	-	-	23,6 L/s (50 PCM)	51,9 L/s (110 PCM)
SECONDARY BATHROOM(S)	-	-	14,2 L/s (30 PCM)	51,9 L/s (110 PCM)
LAUNDRY ROOM	-	-	0	-
WORKSHOP	-	-	0	-
NON-FINISHED BASEMENT	4,7 L/s (10 PCM)	18,9 L/s (40 PCM)	-	23,6 L/s (50 PCM)

5 Installation (cont'd)

5.4 INSTALLING THE DUCTWORK AND REGISTERS

WARNING

Never install a stale air exhaust register in a room where there is a combustion device, such as a gas furnace, a gas water heater or a fireplace.

5.4.1 Fully Ducted System (as illustrated in Section 4.1)

Stale air exhaust ductwork:

- Install registers in areas where contaminants are produced: bathrooms, laundry room, etc.
- Install registers 6 to 12 inches (152 to 305 mm) from the ceiling on an interior wall OR install them in the ceiling (the duct leading to the register must never go through the attic).
- If a register is installed in the kitchen, it must have a washable filter and be located at least 4 feet (1.2 m) from the range.
- If possible, measure the velocity of the air flowing through the registers. If the velocity is higher than 400 ft/min. (122 m/min), then the register type is too small. Replace with a larger one.

Fresh air distribution ductwork:

- Install registers in every bedrooms, in living room and a minimum of one per level without bedroom nor living room.
- Install registers high on the walls with air flow directed towards the ceiling. The horizontal draft must be perceptible at 3 ft. (910 mm) from register.
(The cooler air will then cross the upper part of the room and mix with room air before descending to occupant level.)

5.4.2 System Combined with a Furnace (as illustrated in Section 4.2)

Stale air exhaust ductwork: (same as for Fully Ducted System, described on point 5.4.1)

Fresh air distribution:

WARNING

When performing duct connection to the furnace, installation must be done in accordance with all applicable codes and standards. Please refer to your local building code.

- Cut an opening into the furnace return duct not less than 10 feet (3.1 m) from the furnace (A+B).
- Connect this opening to one end of the top section of a metal T coupling (the T will be reversed, see shaded part in Figure 8).
- Connect the other end of the T coupling top section to the fresh air distribution port of the HRV (see Figure 8).

NOTE: For this case, it is essential that the furnace blower runs when the unit is in operation. Synchronize the furnace blower operation with the HRV operation (see Section 6.3).

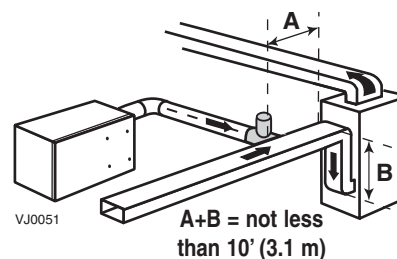


Figure 8

5. Installation (cont'd)

5.5 CONNECTING THE DUCTS TO THE UNIT

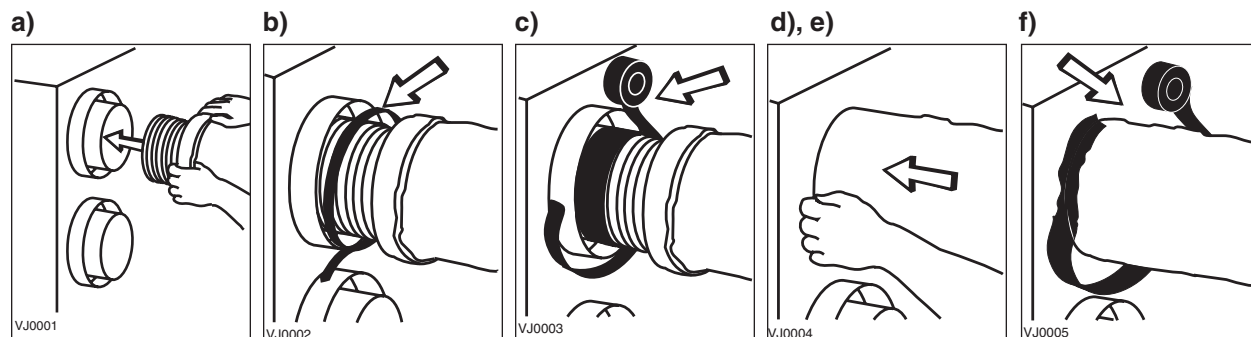
Insulated flexible duct

Use the following procedure for connecting the insulated flexible duct to the ports on the unit (exhaust to outside and fresh air from outside).

- Pull back the insulation to expose the flexible duct.
- Connect the interior flexible duct to the port using a duct tie.
- Carefully seal the connection with duct tape.
- Pull the insulation over the joint and tuck it between the inner and outer rings of the double collar.
- Pull the vapor barrier over the insulation and over the outer ring of the double collar.
- Apply duct tape to the joint making an airtight seal. Avoid compressing the insulation when you pull the tape tightly around the joint. Compressed insulation loses its R value and causes water dripping due to condensation on the exterior surface of the duct.

CAUTION

Make sure that the vapor barrier on the insulated ducts does not tear during installation to avoid condensation within the duct.



Rigid ducts

Use duct tape to connect the rigid ducts to the ports.

CAUTION

Do not use screws to connect rigid ducts to the ports.

Make sure that the 2 balancing dampers are left in a fully open position before connecting the ducts to these ports (fresh air distribution port and stale air exhaust port as shown on Figure 9).

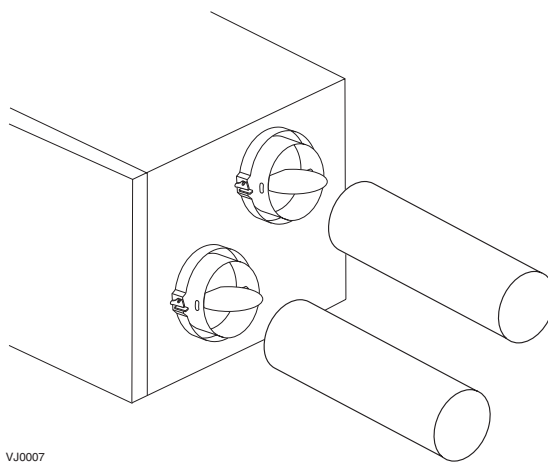


Figure 9

5. Installation (cont'd)

5.6 INSTALLING THE EXTERIOR HOODS

Choose an appropriate location for installing the exterior hoods:

- a minimum distance of 6 feet (1.8 m) between the hoods to avoid cross-contamination
- a minimum distance of 18 inches (457 mm) from the ground

Make sure the intake hood is at least 6 feet (1.8 m) away from any of the following:

- dryer exhaust, high efficiency furnace vent, central vacuum vent
- gas meter exhaust, gas barbecue-grill
- any exhaust from a combustion source
- garbage bin and any other source of contamination

Refer to Figure 10 for connecting the insulated duct to the hoods. Place the “FRESH AIR INTAKE” sticker, provided in the installation kit, on corresponding hood. An “Anti-Gust Intake Hood” should be installed in regions where a lot of snow is expected to fall.

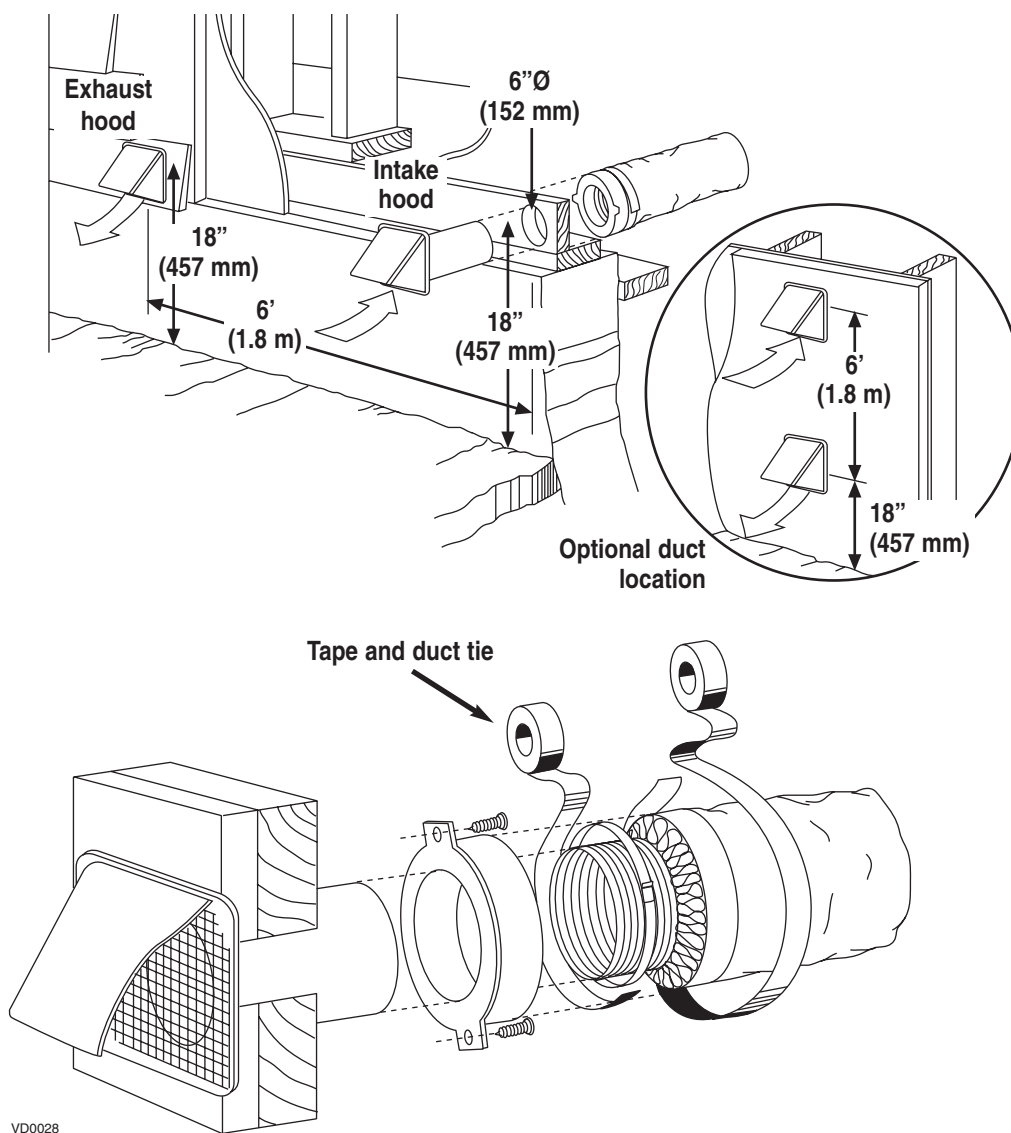
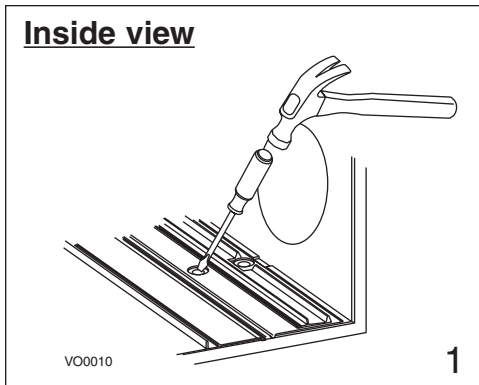


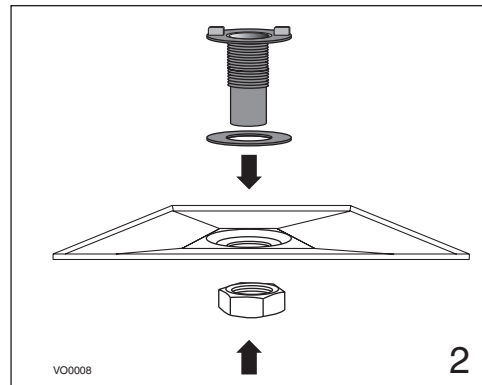
Figure 10

5. Installation (cont'd)

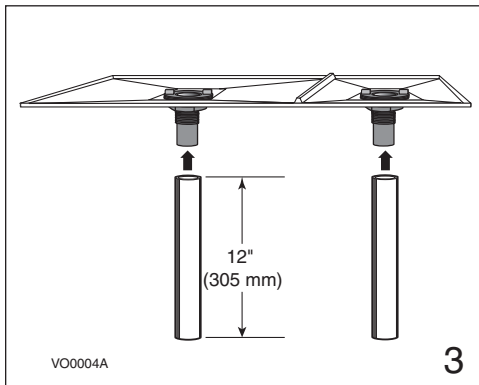
5.7 CONNECTING THE DRAIN



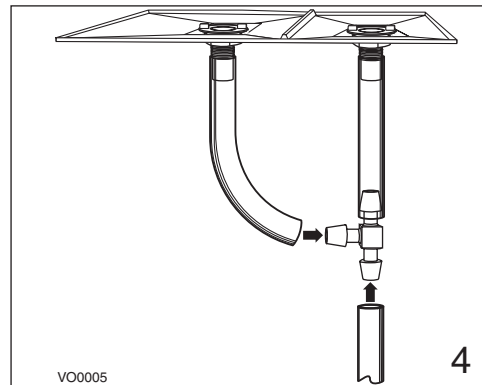
To install the drain fittings, punch the 2 knock-out sections located at the bottom of the unit.



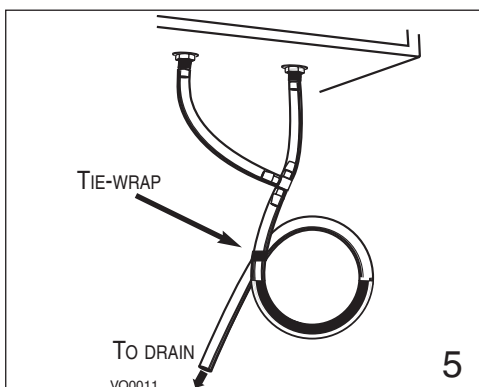
In order to keep the drain pan intact, hand tighten the 2 plastic drain fittings to the unit using the gaskets, washers and nuts as shown.



Cut 2 sections of plastic tubing, about 12" (305 mm) long and attach them to each drain fitting.



Join the 2 short sections to the "T" junction and main tube as shown.



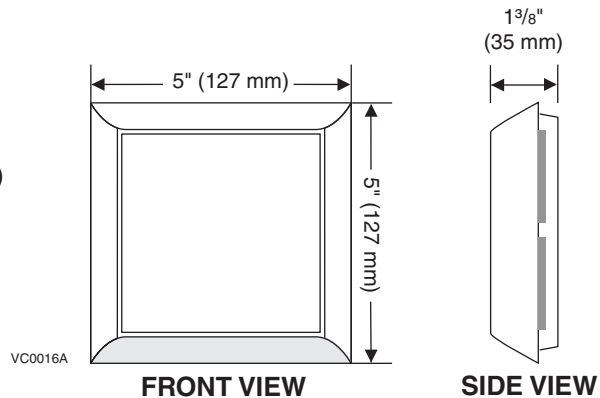
Make a water trap loop in the tube to prevent the unit from drawing unpleasant odors from the drain source. Make sure this loop is situated **BELOW** the "T" as shown. This will prevent water from being drawn back up into the unit in case of negative pressure. Run the tube to the floor drain or to an alternative drain pipe. Be sure there is a slight slope for the run-off.

6. Maximum Main Control

6.1 DIMENSIONS AND SPECIFICATIONS

Voltage: 12 volts DC

Dimensions: 5" x 5" x 1 3/8"
(127 mm x 127 mm x 35 mm)



6.2 MAIN CONTROL INSTALLATION

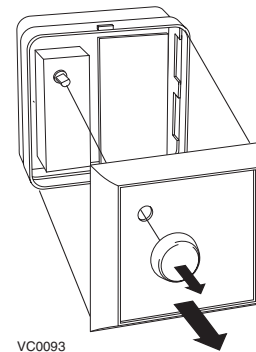
CAUTION

Never install more than one main control per unit.

INSTRUCTIONS:

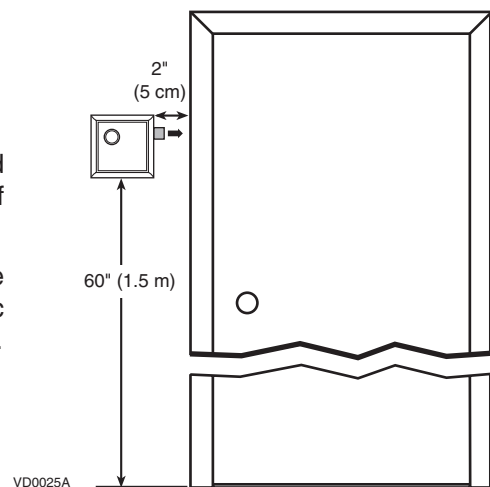
- 1- Determine the location of the control. The wall control must be installed in a central location on the main floor. Typical locations for these controls are main hallways and family room.

- 2- Remove the button and the cover plate of the control.

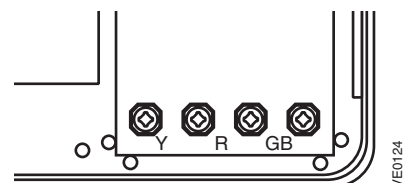


- 3- Install the wall control 60 inches (1.5 m) from the floor and leave a free space of at least 2 inches (5 cm) to the right of the control to allow user to slide out the control instructions.

Use the template provided in the control box to position the wire hole and the screw holes. Use the screws and the plastic anchors provided in the installation kit to secure the control.



- 4- Connect the wires to the main control.

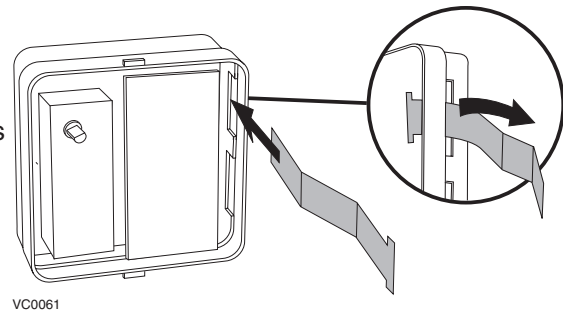


6. Maximum Main Control (cont'd)

6.2 MAIN CONTROL INSTALLATION (CONT'D)

5- Make sure the instruction pull-out is in the occupant's language. If not, turn it to the other side.

6- Reinstall the cover plate and the button.



VC0061

7- Connect the wires to their corresponding position inside the electrical compartment.

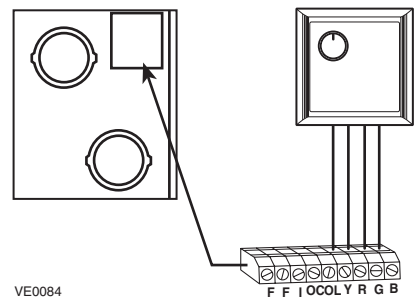
Make sure the connections of the unit and of the wall control correspond exactly.

8- Connect the optional controls.

9- Do the appropriate connection to the furnace (if applicable) by referring to Section 6.3.

10- NOTE: If you are in a cold region, set up "extended defrost" by removing jumper JU1F on the main circuit board inside the electrical compartment (see Section 7).

11- Plug in the unit and do the "overall verification" of the system as described in Section 9.



VE0084

6.3 ELECTRICAL CONNECTION TO THE FURNACE

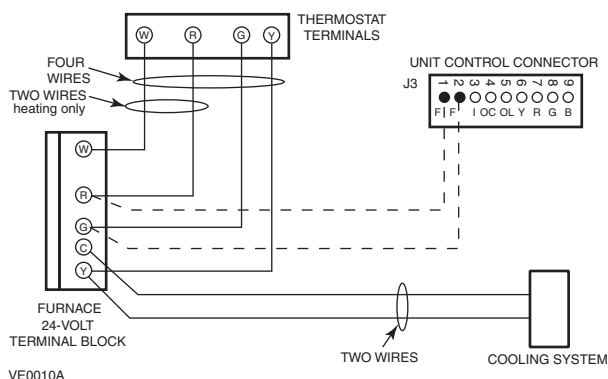
⚠ WARNING

Never connect a 120-volt AC circuit to the terminals of the furnace interlock (standard wiring). Only use the low voltage class 2 circuit of the furnace blower control.

For a furnace connected to cooling system:

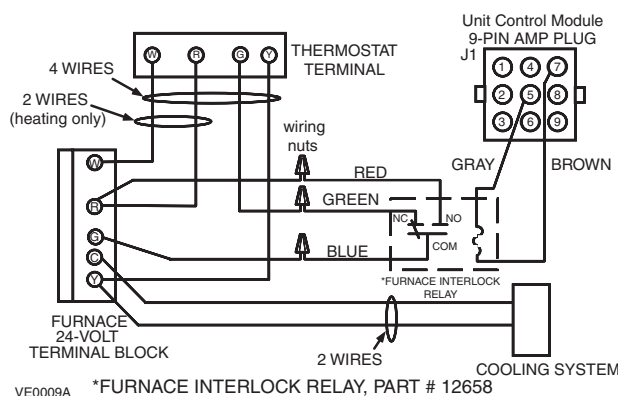
On some older thermostats, energizing the "R" and "G" terminals at the furnace has the effect of energizing "Y" at the thermostat and thereby turning on the cooling system. If you identify this type of thermostat, you must use the "alternate furnace interlock wiring". An additional control relay will then have to be installed.

Standard furnace interlock wiring



VE0010A

Alternate furnace interlock wiring

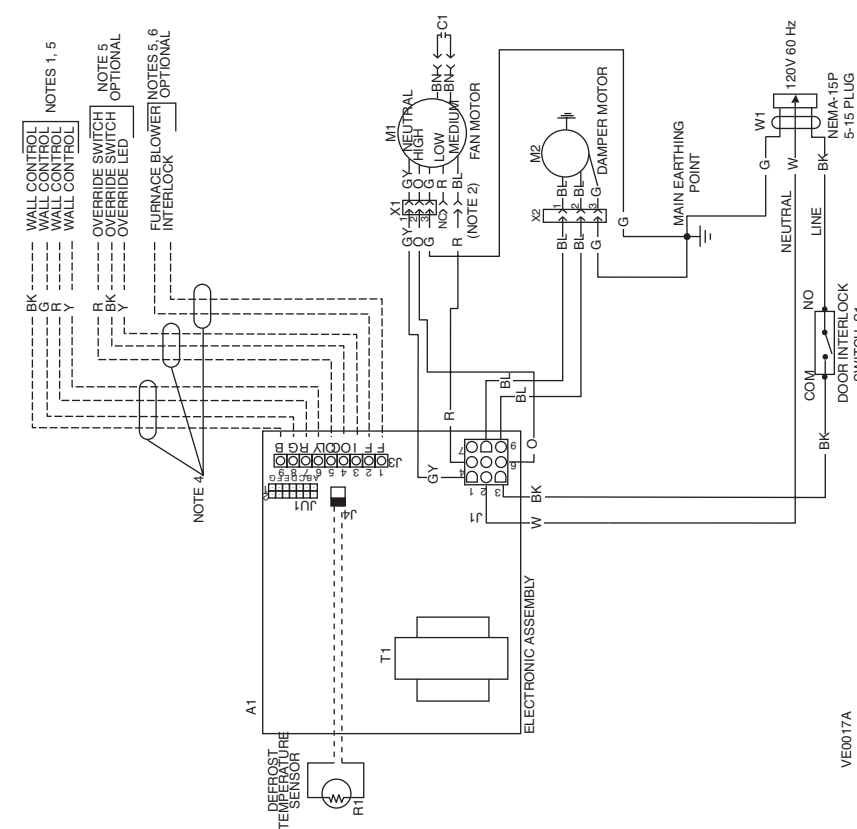


VE0009A

*FURNACE INTERLOCK RELAY, PART # 12658

Models: 90H Novo+ & 190H Novo+

Connection



VE0017A

NOTES

- Controls available. See Section 6 (Low voltage only, 12VDC).
- The factory set wiring for blower speed selection is high and low. Medium speed can be selected instead of low speed. Disconnect the RED wire from the motor RED tap and connect it to the motor BLUE tap.
- If any of the original wire, as supplied, must be replaced, use the same or equivalent wire.
- Use the factory supplied protective tubing.
- The field wiring must comply with applicable codes, ordinances and regulations.
- The furnace fan circuit must be class 2 circuit only.

COLOR CODE

BK	BLACK	NC	NO CONNECTION
BL	BLUE	O	ORANGE
BN	BROWN	R	RED
G	GREEN	W	WHITE
GY	GREY	Y	YELLOW

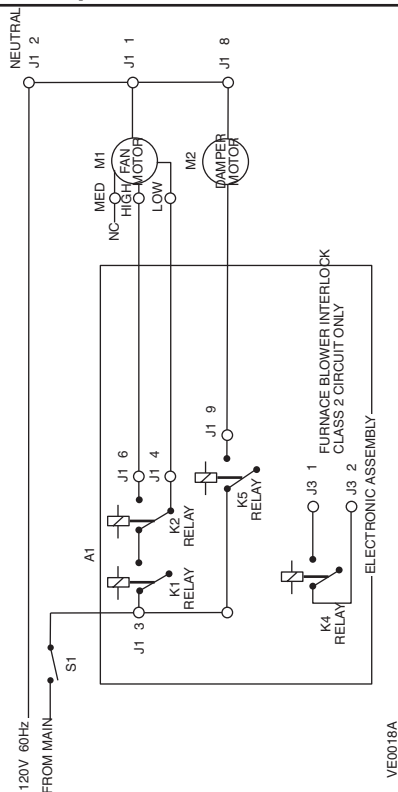
—	LINE VOLTAGE
---	LOW VOLTAGE
---	AND FIELD WIRE

Logic

7. Wiring Diagram

⚠ WARNING

Risk of electrical shocks. Before performing any maintenance or servicing, always disconnect the unit from its power source.



VE0018A

JUMPER TABLE										DEFROST TIME DEFROST/VENTILATION MINUTES	
JU 1											
A	B	C	D	E	F	G					
JU1A	JU1B	JU1C	JU1D	JU1E	JU1F	JU1G				23°F	5°F
IN	OUT	OUT	OUT	IN	IN	OUT				-5°C	-15°C
IN	OUT	OUT	OUT	IN	OUT	OUT				-22°F	-27°C
IN	OUT	OUT	OUT	IN	OUT	OUT				6/60	6/32
IN	OUT	OUT	OUT	IN	OUT	OUT				10/30	10/20
IN	OUT	OUT	OUT	IN	OUT	OUT				10/15	10/15

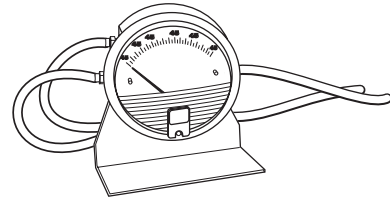
FUNCTION TABLE				RELAY			
MODE	K1	K2	K4*	K5			
Intermittent	0	0	0	1			
Exchange Low	1	0	1	0			
Exchange High	1	1	1	0			
Circulation Low	1	0	1	1			
Circulation High	1	1	1	1			
Defrost Cycle	1	1	1	1			
Off	0	0	0	1			

0 = Relay coil is de-energized
1 = Relay coil is energized
* On special mode, K4 is cycling 10 min. ON and 20 min. OFF

8. Air Flow Balancing

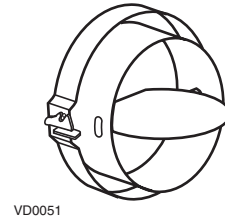
WHAT YOU NEED TO BALANCE THE UNIT

- A magnehelic gauge capable of measuring 0 to 0.5 inch of water (0 to 125 Pa) and 2 plastic tubes.
- The balancing chart provided with the unit.



PRELIMINARY STAGES TO BALANCE THE UNIT

- Seal all the unit ductwork with tape. Close all windows and doors.
- Turn off all exhaust devices such as range hood, dryer and bathroom fans.
- Make sure the balancing dampers are fully open.
- Make sure all filters are clean (if it is not the first time you balance the unit).



BALANCING PROCEDURE

1. Set the unit to high speed:

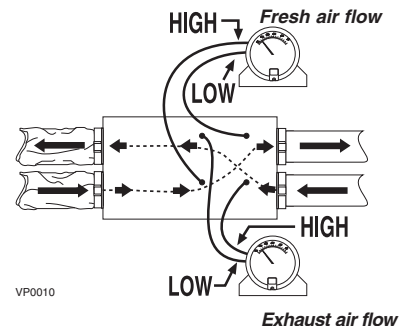
Make sure that the furnace blower is ON if the installation is in any way connected to the ductwork of the cold air return. If the outside temperature is below 0°C/32°F, make sure the unit is not running in defrost while balancing. (By waiting 10 minutes after plugging the unit in, you are assured that the unit is not in a defrost cycle.)

2. Place the magnehelic gauge on a level surface and adjust it to zero.

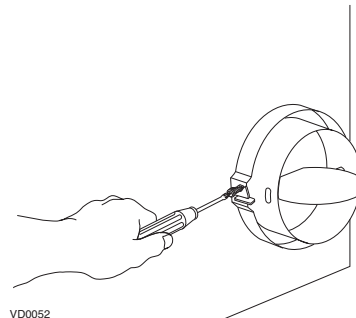
3. Connect tubing from gauge to EXHAUST air flow pressure taps (see diagram).

Be sure to connect the tubes to their appropriate *high/low* fittings. If the gauge drops below zero, reverse the tubing connections. NOTE: It is suggested to start with the exhaust air flow reading because the exhaust has typically more restriction than the fresh air.

Place the magnehelic gauge upright and level. Record equivalent AIR FLOW of the reading according to the balancing chart on the unit.



4. Move tubing to FRESH air flow pressure taps (see diagram). Adjust the fresh air balancing damper until the fresh air flow is approximately the same as the EXHAUST air flow. If fresh air flow is less than exhaust air flow, then go back and adjust the exhaust balancing damper to equal the fresh air flow.



5. Secure both dampers in place with a fastening screw.

6. Write the required air flow information on a label and stick it near the unit for future reference (date, maximum speed air flows, your name, phone number and business address).

NOTE: The air flows are acceptable up to a difference of $\pm 15\%$ between the cfm home needs and the intake or exhaust airflow, but the difference between both airflows must not exceed 10%.

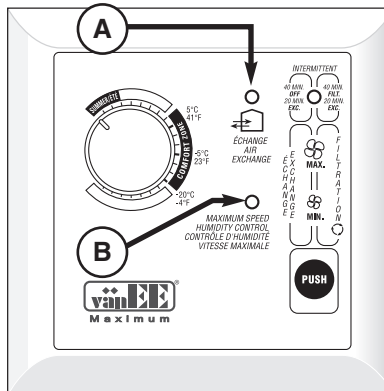
9. Overall Verification

9.1 MAIN CONTROL

This procedure allows the installer to verify that all modes of operation are fully functional.

During the verification of the main control, make sure that all remote controls are inactive.

MAXIMUM (14 different control scenarios to be tested)



VC0092

	Set air supply control to	Set dehumidistat dial to	Results expected		
			Fan speed	Exchange indicator (A)	Max. speed indicator (B)
1	OFF	maximum counterclockwise	off	*off	off
2	OFF	maximum clockwise	off	*off	off
3	MIN. (green light)	maximum counterclockwise	low	on	off
4	MIN. (green light)	maximum clockwise	high	on	on
5	MIN. (red light)	maximum counterclockwise	low	*off	off
6	MIN. (red light)	maximum clockwise	high	on	on
7	MAX. (green light)	maximum counterclockwise	high	on	off
8	MAX. (green light)	maximum clockwise	high	on	on
9	MAX. (red light)	maximum counterclockwise	high	*off	off
10	MAX. (red light)	maximum clockwise	high	on	on
11	INTERMITTENT (green light)	maximum counterclockwise	off/40 min. low/20 min.	*off/40 min. on/20 min.	off off
12	INTERMITTENT (green light)	maximum counterclockwise	high	on	on
13	INTERMITTENT (red light)	maximum counterclockwise	low/20 min. high/40 min.	on/20 min. *off/40 min.	off off
14	INTERMITTENT (red light)	maximum counterclockwise	high	on	on

*The dampers are closed when the exchange indicator is off.

PERMANENT MEMORY

This electronic control has a default memory feature in the event of a power outage. Even the date of the last service reminder is maintained as a convenience to the homeowner.

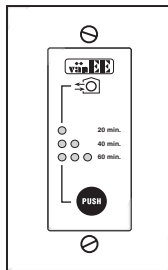
9. Overall Verification (cont'd)

9.2 AUXILIARY CONTROLS

First, turn OFF the main control device before checking the remote auxiliary controls.

20/40/60-MINUTE PUSH-BUTTON TIMER:

Activate the push button. Within 2 seconds, push one time for 20 minutes, two times for 40 minutes or three times for a 60-minute activation.



VC0041

Results expected:

1. Motor speed: high for 20, 40 or 60 minutes.
2. Indicator light goes "ON" and flashes every 5 seconds (one time to indicate a 20-minute operation, two times for a 40-minute, and three times for a 60-minute operation).
3. Air exchange indicator light goes "ON".

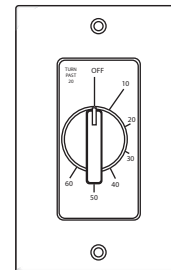
NOTE: To stop activation, push one more time.

60-MINUTE CRANK TIMER:

Activate the timer.

Results expected:

1. Motor speed: high for up to 60 minutes.
2. Air exchange indicator light goes "ON".



VC0017

10. Maintenance/Instructions for User

WARNING

Risk of electrical shocks. Before performing any maintenance or servicing, always disconnect the unit from its power source.

- Review with the user the steps required for the regular maintenance of her/his ventilation system. These steps are described in detail in the user manual:

FOUR TIMES A YEAR:

- Inspect the intake hood, and clean if needed.
- Clean the filters.
- Clean the interior of the cabinet and clean the door.
- Clean the condensation tray and inspect the drain tubing.

ONCE A YEAR:

- Clean the heat recovery core.
- Clean the blades of the blower wheels if needed.

- Warn the user of the necessity to rebalance the system following a major house renovation or following the installation of any extra registers.
- Make sure the user understands how to use the main control as described in the user manual.

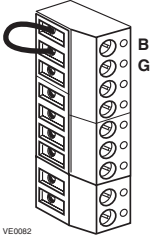
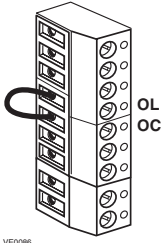
CAUTION

Do not oil the motor. It is already permanently lubricated.

11. Troubleshooting

NOTE: Be sure to unplug and inspect the unit before proceeding with these steps.

Start-up troubleshooting:

Problems	Possible causes	You should try this
1. Unit doesn't work.	<ul style="list-style-type: none"> The circuit board may be defective. 	<ul style="list-style-type: none"> Unplug the unit. Disconnect the main control and the optional(s) control(s). Jump B and G (BLACK and GREEN) terminals. Plug the unit. If the motor runs on high speed and the damper opens, the circuit board is not defective.
		
2. The damper actuator does not work.	<ul style="list-style-type: none"> The 9-pin connector may have a loose connection. The damper actuator may be defective. The circuit board may be defective. 	<ul style="list-style-type: none"> Unplug the unit and check to make sure all the crimp connections are secured. Check the damper actuator connections as well. Feed 120 V directly to the damper actuator. If the problem persists, replace the damper actuator. Replace the circuit board if the problem is not solved by the above.
3. The wall control does not work OR the indicators flash.	<ul style="list-style-type: none"> Erratic operation of the control every 8 seconds. The wires may be in reverse position. The wires may be broken. There may be a short-circuit. The wire in the wall OR the wall control may be defective. The circuit board may be defective. 	<ul style="list-style-type: none"> Unplug the unit. Wait 30 seconds. Plug it back in. Ensure that the color coded wires have been connected to their appropriate places. Inspect every wire and replace any that are damaged. With the help of a multimeter, check for continuity. Jump "B" and "G" (BLACK and GREEN). If unit switches to high speed, remove the wall control and test it right beside the unit using another shorter wire. If the wall control works there, change the wire. If it doesn't, change the wall control. If the unit does not switch to high speed, replace the circuit board.
4. The 20/40/60-min. push-button timer does not work OR its indicator light does not stay on.	<ul style="list-style-type: none"> The 20/40/60-min. push button may be defective. 	<ul style="list-style-type: none"> Jump the OL and OC terminals. If the unit switches to high speed, remove the push button and test it right beside the unit using another shorter wire. If it works there, change the wire. If it doesn't, change the push button.
		

11. Troubleshooting (cont'd)

Problems	Possible causes	You should try this
5. The defrost cycle does not work (the fresh air duct is frozen OR the fresh air distributed is very cold OR the "AIR EXCHANGE" light flashes).	<ul style="list-style-type: none"> • Ice deposits may be hindering the damper operation. • The damper rod or the port damper itself may be broken. • The damper actuator may be defective. • The circuit board may be defective. • The thermistor may be defective. 	<ul style="list-style-type: none"> • Remove the ice. • Inspect these parts and replace if necessary. • Plug in the unit and select "MIN." or "MAX." Press the door switch and see if the port damper opens. If it doesn't open, feed 120V directly to the damper actuator. If the port damper still doesn't open, replace the damper actuator. • Unplug the unit. Unplug the defrost sensor wire (see J4 on electrical diagram Section 7.). Plug the unit back in. Select "MIN." and make sure the unit is adjusted for low speed operation (turn dehumidistat knob on main wall control maximum counterclockwise). Wait 3 minutes. The unit should switch to high speed and the damper at the fresh air intake port should close (defrost mode). If this doesn't happen, then replace the circuit board. • If the defrost mode works well after having disconnected the thermistor wire (above test), this means the thermistor is probably defective. You should replace it.

12. References

- HVI, "Installation Manual for Heat Recovery Ventilators", 1987 edition.
- ASHRAE 1984 Systems Handbook, chapter 11, "Air Distribution Design for Small Heating and Cooling Systems".

